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monuments not only of the ingenuity of mankind but also of the wonders of the physical world. In this book there may be found a vast store of information written largely from the engineer's standpoint, but of necessity portraying the varying physical features which advancing civilization is striving to subdue. Each chapter deals with a single enterprise, as "Across Siberia by Rail"; and each is extensively illustrated. The pictures are remarkable and form an invaluable feature. The history of tunnel construction centers around the boring of the Gotthard. Among other topics are the narrow-gauge railroad, an effort to reduce the cost of construction, which reaches its climax in the Otavi line in German South-West Africa; Meigg's masterpiece, the Oroya road; the penetration of Alaska; Rhodes's dream of a Cape to Cairo connection; the difficulties of the desert in building the Pilgrim Road to Mecca; the conquest of heavy rainfall in building the railroad around the lower Congo rapids; Flagler's railroad over the sea to Key West; and the first continental railroad across South America from Buenos Aires to Valparaiso. The romance connected with the construction of these great pathways of commerce is told in a popular vein.

ROBERT M. BROWN.

TEXT BOOKS

The Student's Handbook of Stratigraphical Geology. By A. J. Jukes-Browne. 2nd edition. xiv and 668 pp. Maps, ill., index. Edward Stanford, London, 1912. 12s. 8 x 5½.

The new edition of this well known textbook contains numerous amplifications. The work is restricted to the geology of Europe. The British Isles have been treated with the full degree of comprehensiveness required by the stage of learning of the students for whose use the book is intended. This has not prevented the author from considering stratigraphic succession as a unit in which the strata missing in Great Britain are studied with as much detail as those represented. Thus considered, European stratigraphy is particularly well described. The physical and geographic conditions related to the formation of each of the great series of strata are discussed briefly. They have been restored cartographically in the case of the Lower Devonian, the Upper Trias and the Lower Cretaceous. This constitutes a happy innovation in English textbooks and one which, it is hoped, may be maintained. The new edition also contains more illustrations and maps than the previous one.

LEON DOMINIAN.

GENERAL

The Century Atlas of the World. Prepared under the superintendence of Benjamin E. Smith, A.M., L.H.D. 45 historical and 294 geographical maps (including 168 insets) on 139 plates; index. Vol. XII of the Century Dictionary and Cyclopedia. Revised and enlarged edition, 1911. The Century Co., New York. Not sold separately. 12 x 9.

The chief value of the Century Atlas to the geographer lies in its large-scale maps of the individual states of the United States and of the provinces of Canada. In the inclusion of such maps it is not unlike other general reference atlases published and printed in the United States; it is in the more careful compilation, however, and in the superior mechanical reproduction of its maps that the Century Atlas stands out among current American atlases. Especially in this latter respect it holds a special place in American cartography; however unsuited to the highest quality of map-making the wax engraving process may be, one may well concur with Zondervan (*Allgemeine Kartenkunde*, 1901, note p. 157) in the opinion that the Century Atlas represents the highest type of work that this process is capable of. The credit for this work is due the Matthews-Northrup Works of Buffalo.

The states of the United States are represented on 52 plates. With a few exceptions each state is at least shown on a separate plate; in the case of the more important states, however, two or more plates are devoted to one state. The average scales employed for the various sections of the country are: New

England, 9-13 miles to the inch; Middle Atlantic States, 16 miles; Middle Western and Southern States, 22-27 miles; Rocky Mountain states, 40-50 miles; states of the Pacific Slope, 25-32 miles. Ontario, Quebec and the Maritime Provinces are shown on scales varying from 27 to 34 miles to the inch.

To these maps of the United States and Canada have been added in the new edition two instructive maps on the scale of 37 miles to the inch showing the electric railways (trolleys) of New England, the Middle Atlantic and the Central States. Large-scale maps of Alaska, Cuba, Haiti, Porto Rico, the Philippines and Hawaii respond to our special interest in these regions.

The maps of non-American territory, while very fair, have nothing special either in scale or content to commend themselves to users of such standard atlases as the Andree, Stieler, or Vivien de St. Martin. They are all characterized, however, by careful compilation and neat appearance.

Throughout the atlas this neat appearance is especially enhanced by the use of marginal instead of areal colors alone to denote political divisions and by a felicitous selection of harmonizing colors. Legibility is assured by the use of olive for relief and red for railroads. Relief is shown by contours and hachures on the maps of the United States, Canada and Mexico, and by hachures alone on the others. Other valuable features of the atlas are the delineation of steamship routes on the larger scale maps, the use of isobaths, and the representation of explorers' routes on the general maps. Mention should also be made of the extremely convenient size of the atlas which allows of easy reference.

A short section devoted to historical maps and an index containing 180,000 names complete the atlas.

The Century Atlas, which has been constantly revised since its inception in 1897, especially in 1899 and 1901, may therefore in its present edition be considered as representing a material advance towards the realization of that desideratum, an American atlas for general reference which satisfies the requirements both of scientific and of technical standards. W. L. G. J.

Mathematische Geographie. Von Prof. Dr. Hermann J. Klein. Dritte verbesserte Auflage. 261 pp. Diagrams, index. J. J. Weber, Leipzig, 1911. Mk. 2.50. $7\frac{1}{2} \times 4\frac{1}{2}$.

A useful little handbook. The bits of history of science are the most interesting parts of a work neither better nor worse in form of presentation than most books of its kind. Its readers will probably be in quest of knowledge, willing to work and not too expectant of amenities of style. But why call it *geography*? My name for it would be terrestrial astronomy or terrestrial mathematics. Not strange that it should have this character, as Dr. Klein is an astronomer. Form and motion of the earth, gravity, precession, nutation, globes and maps are his topics. Why include *precession* and *nutation* in mathematical geography? Why omit the customary tides?

There is a very general tendency nowadays to make biological reactions essential to geography, to insist that the earth, as it were, *account for its inhabitants*. The form of the earth affects them, so do its weight and motions, but the bearing of precession and nutation on plant or animal must be rather remote. The treatment here is frankly astronomical, which may fairly be objected to as long as geography is in the title.

What is the proper subject of mathematical geography? Map-making, gravity, day and night (rather than *rotation*), seasons (rather than revolution of the earth); anything geographical under some one of the modern conceptions is mathematical geography when mathematically treated. *Geographical*, however, should not be regarded as equivalent to *terrestrial*. MARK JEFFERSON.

The Association of History and Geography. By A. J. Berry. 171 pp. Blackie & Sons, Ltd., London, 1911. 1s. 6d. 7×5 .

History has the first place in the title of this interesting little volume as well as in the author's mind. Its geography is of the type now passing away. There can be no doubt of Mr. Berry's intimacy with much history, while nothing in the book compels us to suppose he has any knowledge of modern physiography